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Current Situation and Countermeasures of Agricultural Technological Innovation and Achievement Transformation

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ABSTRACT
Driven by a new round of global scientific and technological revolution and industrial transformation, agriculture, as a basic industry of the national economy, is undergoing a deep transformation with intelligence, ecology and integration as the core. The theoretical construction of new quality productivity provides a new paradigm for agricultural modernization, the core of which is to promote the jump of agricultural production efficiency and value chain through technical factor reorganization and production process reengineering. However, the transformation of agricultural scientific and technological achievements in China still faces multiple challenges: the structural mismatch between scientific research supply and market demand leads to a large number of technological achievements staying in the laboratory stage; The efficiency of the grass-roots agricultural technology extension system is insufficient, and the "last kilometer" of technology landing has not been completely opened up; The multi-subject collaborative innovation mechanism is not perfect, and there is no effective linkage between enterprises, scientific research institutions and small farmers. The risk protection system of technology application is not perfect, which restricts the willingness of small-scale business entities to adopt new technologies. Based on the actual needs of agricultural modernization transformation, this paper systematically reviews the theories and practices of agricultural scientific and technological achievements transformation at home and abroad, focuses on key dimensions such as market link mechanism, industrial integration path, international cooperation network and risk sharing system, and proposes systematic solutions. The research emphasizes the establishment of demand-oriented reverse innovation model to promote the precise docking of scientific research projects and industrial needs; Deepen cross-field technology integration, and explore collaborative innovation in agriculture, digital technology, cultural and tourism services and other industries; Build a global technology cooperation platform to promote mutual recognition of technical standards and resource sharing; We will improve the mechanism for risk prevention and control and benefit distribution, and increase the internal driving force for multiple entities to participate in transformation. Through multi-dimensional institutional innovation and practical exploration, the paper aims to solve the problem of "disconnection between research and application" of agricultural science and technology, and provide theoretical support and path reference for the practical transformation of new quality productivity in the agricultural field.
KEYWORDS
Agricultural Science and Technology;Technological Innovation;Digital Agriculture;Achievement Transformation

1 Introduction

In the past few years, global increase in food request is not pain. Under the influence of the global heat and the world's population in firmly and the primarily in shatters that makes agricultural challenges. The state the state of the state 1924 the ram of series of series which makess on the world-agald systems. For example, although the global agricultural value has a year old is functioning from 40% to 2009 to 2009 to 26% in the 2612 of 2612 of the 2612 in US $ 261 FAO FAO INTURENIST 2023 provides that from 2050, the global food question will be 60%. However, reduce arabic land and extreme weather events have gone traditional adds to the boundaries of productivity growth.in a village and populated as Chinese, this contradiction is especially important. 2023 report on the development of the agricultural industry to the Ministry and Rurals shows the National Multigeel The culture index reached 136% and the intensity of fertilizing use has exceeded international alarm line of 30%. Such the circumstances, you make the application of digital technology in farming is urgent. The Ministry hasended that digital farm is the revolution and development of digital hergency in the development of development and rural. "2019-2025]. In fact, China has Has already a progress in this area. Eg, the development independently and the application of agricultural sensors, dressers and bots; Information technology of information that integrates the satellite's satellite and iot check-in-land And preter in automatic navigation systems based on paths a lot in garnish picking in regions. However, after these impressive realizations, transformation processing scientific and technological remains a The critical problem.Take the example of HeilongIGIGGE province. By 2011 at 2021, the Accommodation Accommunication Sciences 1,989 WEREBILE (126%) and 22 was industrialized (Zhao Yang, 2025). To the National Nip, anchants innovation in innovation on innovation continuing for the market for these patents (Huo Guoquation (Huo Gobing and Tang Lucyuan, 2023).

2 Literature Review

In recent years, the transformation of agricultural science and technology achievements has become a major focus in academia. Drawing from prior research, this section is divided into three parts: "Promotion Models in China," "Challenges

of Transformation in China," and "Foreign Practices in Transformation."

2.1 Promotion Models in China

In the past, promption of China's farm and technology was downward to an economy predicted, the government hersen a role (zheng jianangbo & whose heheri, 2009). However, above Decade Passign, more modern models edit to meet new needs, as the university industry form. " This model promove close among the industry, world institutions, all the example institition, forking all of the common market and market and market and market Challenges. With its initial, local governancy, agricultural and farming university of agricultural accallectiforts and actively participate (Huai Mengiao et al., 2022).

2.2 Challenges of Transformation in China

In the past ten years, the development of agricultural science and technology in our country has advanced by leaps and bounds, and has gradually changed from "runner" to "leader" in some fields. According to the Ministry of Agriculture and Rural Affairs, the contribution rate of agricultural science and technology progress jumped from 53.5 percent in 2012 to 62.4 percent in 2022, and breakthroughs were made in core technologies such as rice genomics, hybrid wheat breeding, and intelligent agricultural machinery and equipment. At present, the coverage rate of improved crop varieties exceeds 96%, the area of independently selected varieties accounts for 95%, the number of plant protection drones exceeds 160,000, and the penetration rate of agricultural digital transformation reaches 43%. These achievements mark that the overall level of China's agricultural science and technology has entered the forefront of the world, providing core support for the "19 consecutive abundant grain output" and poverty alleviation. However, the transformation of agricultural scientific and technological achievements into real productive forces still faces deep-seated contradictions. According to the report on the transformation of agricultural scientific and technological Achievements inChina in 2022, the conversion rate of agricultural scientific and technological achievements in China is only 41.3%, far lower than the level of 60%-80% in developed countries, and only less than 30% of about 23,000 agricultural patent technologies are industrialized every year. From the supply side, there are nearly 7, 000 agricultural scientific and technological achievements invented in China every year, but the actual conversion rate is less than 40% (Zhang Jiaofang 2011). This also shows that although our country has made good achievements in the research and development of agricultural scientific and technological achievements, it has ignored the work in the transformation of achievements. At its root, it can be classified as "imbalance between the supply and demand of agricultural scientific and technological achievements", "lack of incentives for social capital participation" and "mismatch mechanism between scientific research supply and industrial demand".

2.2.1 Supply-Demand Imbalance in Agricultural Sci-Tech Achievements

Since the implementation of the household contract responsibility system in China, it has effectively improved the farmers' production enthusiasm and increased their production capacity. However, with the passage of time and the progress of science and technology, this small-scale production mode has hindered the progress of agricultural science and technology. Small-scale farmers are subject to inertia, still rely on the dividends brought by production experience, and the demand for new technologies is not high. Due to the small scale of farming and the new challenges and initial inputs required to change production methods, most farmers are not very receptive to technology. According to the "Analysis Report on the status quo of China's land circulation market" released by Niche Research Institute, as of 2017, more than 65% of China's arable land was still in the traditional smallholder management mode. This phenomenon is not conducive to the expansion of agricultural science and technology market space.

2.2.2 Insufficient participation of social capital

The transformation of agricultural science and technology has the characteristics of long cycle and high risk (Bao Cong 2024). According to the data of the Ministry of Finance, the R&D intensity of agricultural technology enterprises is only 2.1%, which is lower than that of the industrial sector (2.8%) and information technology industry (7.5%). Social capital is not enthusiastic about agricultural science and technology investment, and the venture investment in agricultural science and technology in 2022 only accounts for 1.7% of the whole industry. A person in charge of a biological breeding company said frankly: "It takes at least 8 years and more than 500 million yuan from the laboratory to commercialization, but the new varieties are easy to be imitated after promotion." The weak protection of intellectual property rights has led to a lack of incentives for enterprises to research and development, and the proportion of agricultural technology contract turnover in the total technology market of the country is less than 3%, far lower than the proportion of

agricultural GDP (7.3%).

2.2.3 Mismatch between scientific research results and industrial demand

At present, there is still a tendency of "emphasis on paper and light application" in the establishment of agricultural scientific research projects. According to statistics, about 65% of the topics in agriculture-related universities and research institutes are based on published papers or patents, and only 15% require field verification. This evaluation orientation results in a large number of results remaining in the laboratory. For example, although the intelligent greenhouse control system developed by a provincial Academy of Agricultural Sciences has won a national patent, the cost of a single set of equipment is as high as 300,000 yuan, far exceeding the affordability of ordinary farmers, and the final promotion rate is less than 1%. In addition, the needs of scientific research institutions and business entities are insufficient, more than 70% of new agricultural business entities reflect that "can not find suitable technology", while scientific research institutions are faced with the embarrassment of "idling fruit bank".

2.3 Foreign Practices

Globally, Countries are attackers change in the weather, food security and unspeakable agricultural with innovated access. Catherinez (2016) Notes that public sets cannot provide these challenges provide private partosis (PPP) to stimulate the inheritation. These partnerships-decision-investment, investment and exchange of knowledge, improvement innovation and transformation prompted - the precious minuses for China.Japan, gave her geography, Add a great importance to the farmer. Humemoto mason (2019) in rural work and increased workstated carrs brought on more market (ict, rt, ai). Jircas (2021) Progs to partnerships not say and international and international patterns, the international manners, agricultural and agricultural skiers, increase in practical application.

3 Countermeasures for China

In view of the significant gap between the conversion rate of agricultural scientific and technological achievements in China (41.3%) and that in developed countries (60%-80%), it is necessary to build a multi-dimensional collaborative mechanism. First, strengthen the market orientation and establish a "demand list" system, such as Pinduoduo to reverse guide the research and development of "low-sugar grape" varieties through consumption big data. The second is to deepen international cooperation, promote cross-border technical cooperation such as Zoomlion's "Polar Intelligent agricultural machinery", and expand the export of "Belt and Road" technology. The third is to promote the integration of three industries and learn from the "digitalization of tea tourism" model in Anji, Zhejiang. The fourth is to improve risk sharing, promote Jiangsu's "rice intelligent planting insurance", and build an innovation ecology with deep integration of production, university and research through government subsidy premiums and enterprise joint insurance.

3.1 Strengthen Market Linkages

After all, the research and innovation of agricultural science and technology must be implemented into the actual production and life. In the context of market economy regulation, products that do not meet market needs will soon be eliminated. Therefore, when developing agricultural technology, we should broaden our horizons, not only consider the innovation itself, but also take the market demand into account, strengthen the connection with the market, and improve the conversion rate of results. For example, in 2021, Pin-Duo and China Agricultural University launched the "Agricultural Science and Technology Innovation Alliance" to reverse guide the direction of scientific research through platform consumption of big data. For example, based on the surge in consumer searches for "low-sugar fruits" (up 137% annually), the research team targeted the cultivation of "Sunshine rose grapes" with a 30% reduction in sugar content, through the "direct origin + order farming" model.

3.2 Deepen International Cooperation

Each country makes an agricultural agricultural challenges, the farm variety, as the variety climate, limited resources or specific pressures and diseases. The International Couterings can play a VITUGA role addressing these issues allowed so that permanents mutual teaching thanks to the exchange of knowledge. It also brings up the development of the most efficient models and various inter-living negotiations, provide food safety and cheapest stability. Also, the efforts of cooperation can Amplain the farming efficiency presenting farming techniques and common-innations, I am in-indian agributing agricultural support.

3.3 Enhance Industry Integration

Agriculture does not exist as a separate industry, industry, tourism and so on are closely related to it. Therefore, agricultural scientific and technological achievements are not necessarily limited to the agricultural industry, and strengthening its linkage with other secondary and tertiary industries can also improve the conversion rate of achievements. For example, the combination of agriculture and tourism, the creation of special rural tourism projects, the creation of cultural and creative products, etc., can translate the results into actual income. Anji County has transformed 180,000 mu of white tea gardens into "traceable tea gardens" through implant iot technology. Each tea plant is equipped with an electronic tag, and visitors can scan the code to view the growth data and book a picking experience. At the same time, digital products such as AR tea making games and AI tea artists were developed, which increased the average income of tea gardens from 8, 000 yuan to 32, 000 yuan per mu. The project integrates 5G, blockchain and other technologies, and drives 47 science and technology enterprises to participate, forming a closed-loop ecology of "technology R&D - scenario application - derivative services". In 2023, the model was selected as a "Global Agricultural Cultural Heritage Innovation Practice Case" by the Food and Agriculture Organization of the United Nations.

3.4 Establish Risk Compensation Mechanisms

At present, many farmers in China still cannot get rid of their dependence on the smallholder farming system. The main reason is unease about the risks of new technologies. In order to solve this problem, projects such as technology risk compensation funds can be set up to reduce farmers' rejection of new technologies and improve the conversion rate of results. In 2022, Jiangsu Province jointly launched the country's first "technology application insurance". When farmers use new technologies such as unmanned rice transplanters and intelligent irrigation systems, they can receive compensation of up to 800 yuan per mu if they reduce production due to technical failures. The government subsidizes 60% of the premium, enterprises bear 30%, and farmers only pay 10%.

4 Conclusion

In the context of the technological revolution and globalization of processing the processing transvestes and technological accomplishment and demographic growth. Some delivery are needed to optimize the inherit and processing environments. 4 Inglese of digital agriculture and other advanced technologies for the agricultural winter makes the new opportunity. Right for Speed an effective transference can forget farming from increasing as well as any quiriness and remain resilient to global challenges.

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